K140423

MAY 2 7 2014

6.0 510(K) SUMMARY (PAGE 1 OF 6)

Submitter's Name and Address:	ConforMIS Inc. 28 Crosby Drive Bedford, MA 01730
Establishment Registration Number:	3009844603 and 3004153240
Date of Summary:	February 11, 2014
Contact Person: **Telephone Number:** **Fax Number:**	Amita S. Shah, Sr. Vice President, Regulatory and Quality Affairs (781) 345-9164 (781) 345-0147
Name of the Device:	ConforMIS iTotal® CR Knee Replacement System (iTotal CR KRS)
Common Name:	Cruciate Retaining Knee Replacement System
Regulatory Status and Regulation Number:	Class II 21 CFR 888.3560
Classification Name:	Knee joint patellofemorotibial polymer/metal/polymer semi-constrained cemented prosthesis
Device Classification:	Product Code: JWH: Knee joint patellofemorotibial polymer/metal/polymer semi-constrained cemented prosthesis. OOG: Knee Arthroplasty Implantation System. Intended to be used to assist in the implantation of a specific knee arthroplasty device or a set of specific knee arthroplasty devices. Indicated to include guiding alignment, making or establishing cuts, selecting, sizing, attaching, positioning or orienting implant components. OIY: Prosthesis, knee, patellofemorotibial, semi-constrained, cemented polymer + additive/metal/polymer + additive. This generic type of device includes prosthesis that have a femoral component made of alloys, such as cobalt-chromium-molybdenum, and a tibial component(s) and/or a retropatellar resurfacing component made of ultra-high molecular weight polyethylene plus an additive, such as a-tocopherol.

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Indications for Use:

The iTotal® CR Knee Replacement System (KRS) is intended for use as a total knee replacement in patients with knee joint pain and disability whose conditions cannot be solely addressed by the use of a prosthetic device that treats only one or two of the three knee compartments, such as a unicondylar, patellofemoral or bicompartmental prosthesis.

The Indications for Use include:

- Painful joint disease due to osteoarthritis, traumatic arthritis, rheumatoid arthritis or osteonecrosis of the knee.
- Post traumatic loss of joint function.
- Moderate varus, valgus or flexion deformity in which the ligamentous structures can be returned to adequate function and stability.
- Failed osteotomies, hemiarthroplasties, and unicondylar, patellofemoral or bicompartmental implants.
- Revision procedures provided that anatomic landmarks necessary for alignment and positioning of the implant are identifiable on patient imaging scans.

This implant is intended for cemented use only.

Identification of the Legally Marketed Device (Predicate Device):

ConforMIS iTotal CR Knee Replacement System (ITOTAL CR KRS)

Device Class:	II
Product Code:	JWH, OOG, OIY
Regulation Number:	21 CFR 888.3560
510(k) Number:	K131467, K131019, K122991, K122033, and K120068

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Device Description:

The iTotal® CR Knee Replacement System (hereafter referred to as the "iTotal CR KRS") is a patient specific tricompartmental faceted posterior cruciate ligament (PCL) retaining knee replacement system. The iTotal® CR KRS is a semi-constrained, cemented knee implant which consists of a femoral, tibial, and patellar component.

Using patient imaging (either CT or MR scans) and a combination of proprietary and off the shelf software a patient specific implant is designed, that best meets the geometric and anatomic requirements of the specific patient. The femoral component is manufactured from cobalt chromium molybdenum ("CoCrMo") alloy. The tibial component includes a metal tray manufactured from CoCrMo alloy and either one or two polyethylene inserts. The polyethylene inserts may be manufactured from either UHMWPE or a highly cross-linked Vitamin E infused polyethylene (iPoly XE™) The patellar component is also manufactured from either UHMWPE or from a highly cross-linked Vitamin E infused polyethylene (iPoly XE™).

For user convenience, and similar to the predicate iTotal CR KRS, accessory orthopedic manual surgical instruments designed for use with the modified iTotal CR KRS are provided to assist with implantation. The ancillary instruments are provided sterile and for single-use only. These patient specific instruments are provided to assist in the positioning of total knee replacement components intra-operatively and in guiding the cutting of bone.

The function and general design features of the patient specific implants and ancillary instruments remain similar to those described in the predicate 510(k)'s **K131467** and **K131019**.

Substantial Equivalence:

The product subject of this premarket notification is substantially equivalent to the iTotal CR KRS (**K131467**, cleared July 18, 2013; **K131019**, cleared May 24, 2013; **K122991**, cleared December 20, 2012; **K122033**, cleared September 27, 2012 and **K120068**, cleared February 3, 2012). The following testing was performed to establish substantial equivalence:

- Software verification and validation testing of proprietary software
- Design validation via cadaveric testing

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Device Comparison

Characteristic	Predicate iTotal Cruciate Retaining Knee Replacement System (K131467, K131019, K122991, K122033 & K120068)	iTotal Cruciate Retaining Knee Replacement System (This submission)
Indication for Use	The iTotal CR Knee Replacement System (KRS) is intended for use as a total knee replacement in patients with knee joint pain and disability whose conditions cannot be solely addressed by the use of a prosthetic device that treats only one or two of the three knee compartments, such as a unicondylar, patellofemoral or bicompartmental prosthesis. The Indications for Use include: • Painful joint disease due to osteoarthritis, traumatic arthritis, rheumatoid arthritis or osteonecrosis of the knee. • Post traumatic loss of joint function. • Moderate varus, valgus or flexion deformity in which the ligamentous structures can be returned to adequate function and stability. • Failed osteotomies, hemiarthroplasties, and unicondylar, patellofemoral or bicompartmental implants. • Revision procedures provided that anatomic landmarks necessary for alignment and positioning of the implant are identifiable on patient imaging scans. This implant is intended for cemented use only.	The iTotal CR Knee Replacement System (KRS) is intended for use as a total knee replacement in patients with knee joint pain and disability whose conditions cannot be solely addressed by the use of a prosthetic device that treats only one or two of the three knee compartments, such as a unicondylar, patellofemoral or bicompartmental prosthesis. The Indications for Use include: • Painful joint disease due to osteoarthritis, traumatic arthritis, rheumatoid arthritis or osteonecrosis of the knee. • Post traumatic loss of joint function. • Moderate varus, valgus or flexion deformity in which the ligamentous structures can be returned to adequate function and stability. • Failed osteotomies, hemiarthroplasties, and unicondylar, patellofemoral or bicompartmental implants. • Revision procedures provided that anatomic landmarks necessary for alignment and positioning of the implant are identifiable on patient imaging scans. This implant is intended for cemented use only.
Principle of Operation	Cemented Use Fixed Bearing Design	Cemented Use Fixed Bearing Design
Product Classification	21 CFR 888.3560 (JWH, OOG, OIY)	21 CFR 888.3560 (JWH, OOG, OIY)

Components and Materials	• Femoral Implant: CoCrMo
	• Metal Backed Tibial Components:
	  ○ Tibial tray: CoCrMo
	  ○ Tibial dual or single piece inserts: UHMWPE or iPoly XE
	• All Polymer Patellar Component: UHMWPE or iPoly XE
		• Femoral Implant: CoCrMo
		• Metal Backed Tibial Components:
		  ○ Tibial tray: CoCrMo
		  ○ Tibial dual or single piece inserts: UHMWPE or iPoly XE
		• All Polymer Patellar Component: UHMWPE or iPoly XE

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Device Comparison

Characteristic	Predicate iTotal Cruciate Retaining Knee Replacement System (K131467, K131019, K122991, K122033 & K120068)	iTotal Cruciate Retaining Knee Replacement System (This submission)
Design	Knee joint patellofemorotibial semi-constrained cemented prosthesis	Knee joint patellofemorotibial semi-constrained cemented prosthesis
Patient Matched	Yes	Yes
Instrumentation	Patient specific Nylon jigs	Patient specific Nylon jigs
Proprietary Software for Femoral Components	iTotalWorks version 4.0 or Manual Process	iTotalWorks version 5.0 or Manual Process
Proprietary Software for the Femoral iJigs	iTotal FemJigs version 1.5 or Manual Process	iTotal FemJigs version 2.0 or Manual Process
Proprietary Software for Tibial Components	iTotalTib version 1.0 or Manual Process	iTotalTib version 2.0 or Manual Process
Proprietary Software for Tibial iJigs	N/A – Manual Process	iTotal TibJigs version 1.0 or Manual Process
Proprietary Software for Patient-Specific Surgical Plan	iTotal iView version 1.0 or Manual Process	iTotal iView version 2.0 or Manual Process

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Description and Conclusion of Testing:	**Nonclinical Testing:** The determination of substantial equivalence for this device was based on a detailed device description. The following non-clinical laboratory testing was performed demonstrating that the device is safe and can be considered substantially equivalent to the predicate device for the intended use: • Detailed software description and software verification and validation testing of proprietary software iTotalWorks • Detailed software description and software verification and validation testing of proprietary software iTotal FemJigs • Detailed software description and software verification and validation testing of proprietary software iTotalTib • Detailed software description and software verification and validation testing of proprietary software iTotal TibJigs • Detailed software description and software verification and validation testing of proprietary software iTotal iView • Design validation via cadaveric testing
Safety and Performance:	The determination of substantial equivalence for this device was based on a detailed device description. Non-clinical laboratory testing was performed demonstrating that the device is safe and can be considered substantially equivalent to the predicate device for the intended use. Clinical data is not necessary to demonstrate substantial equivalence.
Conclusion:	Based on the testing conducted, it is concluded that the modified iTotal CR KRS is substantially equivalent to the predicate iTotal CR KRS (**K131467** cleared July 18, 2013, **K131019** cleared May 24, 2013, **K122991** cleared December 20, 2012, **K122033** cleared September 27, 2012, and **K120068** cleared February 03, 2012)

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Food and Drug Administration
10903 New Hampshire Avenue
Document Control Center – WO66-G609
Silver Spring, MD 20993-0002

May 27, 2014

ConforMIS, Incorporated
Ms. Amita Shah
Senior Vice President, Regulatory and Quality Affairs
28 Crosby Drive
Bedford, Massachusetts 01730

Re: K140423
Trade/Device Name: iTotal Cruciate Retaining (CR) Knee Replacement System
Regulation Number: 21 CFR 888.3560
Regulation Name: Knee joint patellofemorotibial polymer/metal/polymer semi-constrained cemented prosthesis
Regulatory Class: Class II
Product Code: JWH, OOG, OIY
Dated: April 23, 2014
Received: April 24, 2014

Dear Ms. Shah:

We have reviewed your Section 510(k) premarket notification of intent to market the device referenced above and have determined the device is substantially equivalent (for the indications for use stated in the enclosure) to legally marketed predicate devices marketed in interstate commerce prior to May 28, 1976, the enactment date of the Medical Device Amendments, or to devices that have been reclassified in accordance with the provisions of the Federal Food, Drug, and Cosmetic Act (Act) that do not require approval of a premarket approval application (PMA). You may, therefore, market the device, subject to the general controls provisions of the Act. The general controls provisions of the Act include requirements for annual registration, listing of devices, good manufacturing practice, labeling, and prohibitions against misbranding and adulteration. Please note: CDRH does not evaluate information related to contract liability warranties. We remind you, however, that device labeling must be truthful and not misleading.

If your device is classified (see above) into either class II (Special Controls) or class III (PMA), it may be subject to additional controls. Existing major regulations affecting your device can be found in the Code of Federal Regulations, Title 21, Parts 800 to 898. In addition, FDA may publish further announcements concerning your device in the Federal Register.

Please be advised that FDA's issuance of a substantial equivalence determination does not mean that FDA has made a determination that your device complies with other requirements of the Act or any Federal statutes and regulations administered by other Federal agencies. You must comply with all the Act's requirements, including, but not limited to: registration and listing (21 CFR Part 807); labeling (21 CFR Part 801); medical device reporting (reporting of medical

device-related adverse events) (21 CFR 803); good manufacturing practice requirements as set forth in the quality systems (QS) regulation (21 CFR Part 820); and if applicable, the electronic product radiation control provisions (Sections 531-542 of the Act); 21 CFR 1000-1050.

If you desire specific advice for your device on our labeling regulation (21 CFR Part 801), please contact the Division of Industry and Consumer Education at its toll-free number (800) 638-2041 or (301) 796-7100 or at its Internet address http://www.fda.gov/MedicalDevices/ResourcesforYou/Industry/default.htm. Also, please note the regulation entitled, "Misbranding by reference to premarket notification" (21CFR Part 807.97). For questions regarding the reporting of adverse events under the MDR regulation (21 CFR Part 803), please go to http://www.fda.gov/MedicalDevices/Safety/ReportaProblem/default.htm for the CDRH's Office of Surveillance and Biometrics/Division of Postmarket Surveillance.

You may obtain other general information on your responsibilities under the Act from the Division of Industry and Consumer Education at its toll-free number (800) 638-2041 or (301) 796-7100 or at its Internet address http://www.fda.gov/MedicalDevices/ResourcesforYou/Industry/default.htm.

Sincerely yours,

Lori A. Wiggins

for
Mark N. Melkerson
Director
Division of Orthopedic Devices
Office of Device Evaluation
Center for Devices and
Radiological Health

Enclosure

Indications for Use

510(k) Number (if known): K140423

Device Name: iTotal CR Knee Replacement System

Indications for Use:

The iTotal CR Knee Replacement System (KRS) is intended for use as a total knee replacement in patients with knee joint pain and disability whose conditions cannot be solely addressed by the use of a prosthetic device that treats only one or two of the three knee compartments, such as a unicondylar, patellofemoral or bicompartmental prosthesis.

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- Failed osteotomies, hemiarthroplasties, and unicondylar, patellofemoral or bicompartmental implants.
- Revision procedures provided that anatomic landmarks necessary for alignment and positioning of the implant are identifiable on patient imaging scans.

This implant is intended for cemented use only.

Prescription Use ____X____ (Part 21 CFR 801 Subpart D)	AND/OR	Over-The-Counter Use _____ (21 CFR 801 Subpart C)

(PLEASE DO NOT WRITE BELOW THIS LINE-CONTINUE ON ANOTHER PAGE IF NEEDED)

Concurrence of CDRH, Office of Device Evaluation (ODE)

Casey L. Hanley, Ph.D.

Division of Orthopedic Devices